Claims

Please amend the claims as follows:

Claims 1-42 (Canceled)

Claim 43 (Original): In a system for automatically determining line-of-sight configurations between nodes, wherein each node has a node height, a method of determining the elevation of a node, comprising:

(a) determining the node's ground location;

(b) determining the node's elevation by reading an elevation from a 3-Dimensional Map at the node's ground location; and

(c) adding the node height to the node's elevation;

whereby the 3-Dimensional map provides elevations given a ground location, wherein said an elevation in the 3-Dimensional Map was determined by adding the height of any objects at a ground location to the elevation of terrain at the ground location.

Claim 44 (Original): The method of claim 43, wherein a node's ground location is its ground coordinates.

Claim 45 (Original): The method of claim 43, wherein the objects at a ground location are selected from the group comprising houses and trees.

Claim 46 (Original): The method of claim 43, wherein said nodes are nodes in an infrared wireless system.

Claim 47 (Original): In a system for automatically determining line-of-sight configurations between nodes, wherein each node has a node height, a method of determining the elevation of a node, a computer-readable medium containing instructions that cause the system to:

determine the node's ground location;

determine the node's elevation by reading an elevation from a 3-Dimensional Map at the node's ground location; and

add the node height to the node's elevation;

whereby the 3-Dimensional Map provides elevations given a ground location, wherein said an elevation in the 3-Dimensional Map was determined by adding the height of any objects at a ground location to the elevation of terrain at the ground location.

Claim 48 (Original): The computer-readable medium of claim 47, wherein a node's ground location is its ground coordinates.

Claim 49 (Original): The computer-readable medium of claim 47, wherein the objects at a ground location are selected from the group comprising houses and trees.

Claim 50 (Original): The computer-readable medium of claim 47, wherein said nodes are nodes in an infrared wireless system.

Claim 51 (Original): A method of determining a possible alternative line-of-sight between a first node and a second node, wherein said nodes are located in an area for which an aerial image is available, comprising the steps of:

(a) determining a first degree of freedom line for the first node, and a second degree of freedom line for the second node, such that each degree of freedom line is orthogonal to the straight line between the nodes;

(a) determining a resolution of the aerial image and an alternative position data parameter;

(b) placing the first node at a first placement that is a distance equal to the resolution in a

first direction along the first degree of freedom line from the current placement of the first node, and

(c) placing the second node at a second placement that is a distance equal to the resolution in the first direction along the second degree of freedom line from the current placement of the second node;

(d) determining if the straight line between the first node at the first placement and the second node at the second placement is a valid, unobstructed line-of-sight;

(e) if the straight line is a valid, unobstructed line-of-sight, saving the line-of-sight; and if the straight line is not a valid, unobstructed line-of-sight, repeating steps (c) – (e) until the first node has been moved the distance specified in the alternative position data parameter.

Claim 52 (Original): The method of claim 51, additionally comprising the step of:

(f) if a valid, unobstructed line-of-sight is not found by moving the nodes in the first direction along the degree of freedom lines to a placement equal to the alternative position data parameter, repeating steps (c) – (e) moving the nodes in a second direction along the degree of freedom lines.

Claim 53 (Original): A method of identifying pixels in an aerial image that are part of a structure, comprising the steps of:

(a) obtaining the aerial image;

(b) dividing the image into blocks;

(c) for each block, clustering pixels in the image into small regions of uniform color and texture; and

(d) identifying at least one region as a structure.

Claim 54 (Original): The method of claim 53, wherein the aerial photograph image is a color photograph.

Claim 55 (Original): The method of claim 53, wherein the structure is a house.

Claim 56 (Original): The method of claim 53, wherein step (b) comprises:

(i) obtaining street data for the area associated with the aerial image;

(ii) updating the image with street information from the street data;

(iii) segmenting the image into elementary city blocks based on the street information;

Claim 57 (Original): The method of claim 56, wherein the street data is comprised a standard electronic street map.

Claim 58 (Original): The method of claim 57, wherein the standard electronic street map is a TeleAtlas map.

Claim 59 (Original): The method of claim 56, wherein the street data includes street names, locations and postal addresses.

Claim 60 (Original): The method of claim 56, wherein step (b)(ii) comprises matching streets in the street data to street pixels in the image.

Claim 61 (Original): The method of claim 60, wherein street segments are shifted such that they are placed close to the middle of the associated street in the image.

Claim 62 (Original): The method of claim 61, wherein accuracy of matching streets in the street data to streets in the image is determined by comparing placement of a street segment from the street data to the color of the pixels in the image at the point of placement.

Claim 63 (Original): The method of claim 62, wherein an expected average street color is determined and accuracy of matching streets is determined by comparing the color of the pixels

in the image at the point of placement to the expected average street color.

Claim 64 (Original): The method of claim 62, wherein street segments in the street data are shifted to match street in the image.

Claim 65 (Original): The method of claim 64, wherein Maximum A Posteriori estimation is used to shift street segments in the street data.

Claim 66 (Original): The method of claim 56, wherein step (b)(iii) comprises segmenting the image into blocks based on the street data obtained in step (b)(i).

Claim 67 (Original): The method of claim 53, wherein step (c) comprises using a Watershed technique to cluster pixels into regions.

Claim 68 (Original): The method of claim 67, wherein the Watershed technique creates regions of similar color.

Claim 69 (Original): The method of claim 53, wherein identifying a region as a house comprises comparing at least one characteristic of the region to at least one expected characteristic of a region encompassing a house.

Claim 70 (Original): The method of claim 69, wherein said at least characteristic is selected from the group comprising color, shape, area, distance from street and distance to closest house.

Claim 71 (Original): The method of claim 70, wherein at least characteristic is color, and the average color of the region is compared to an expected average color of a house.

Claim 72 (Original): The method of claim 53, additionally comprising creating a house map that labels each pixel as a house or not a house depending on the identification in step (d).

Claim 73 (Original): The method of claim 72, wherein said house map additionally identifies each region that as been identified as a house with a house identification code.

Claim 74 (Original): The method of claim 73, wherein every pixel in said house map is identified by a zero if it has not been identified as a house, or by a house number is it has been identified as a house, wherein said house number identifies the house.

Claim 75 (Original): A computer-readable medium containing instructions that cause a computer to identify pixels in an aerial image that are part of a structure, wherein said instructions cause include instructions to:

obtain the aerial image;

divide the image into blocks;

for each block, cluster pixels in the image into small regions of uniform color and texture; and

identify at least one region as a structure.

Claim 76 (Original): A method of identifying tree pixels in an aerial image, comprising the steps of:

(a) obtaining the aerial image;

(b) identifying at least one tree in the image;

(c) creating a statistical model of tree color using the at least one identified tree;

(d) for every pixel, using the statistical model to determine the probability that a pixel is a tree; and

(e) for every pixel, if the probability that a pixel is a tree exceeds a predetermined threshold, labeling the pixel as a tree.

Claim 77 (Original): The method of claim 76, wherein the aerial photograph image is a color photograph.

Claim 78 (Original): The method of claim 76, wherein step (b) comprises a user selecting at least one region on the image that is a tree.

Claim 79 (Original): The method of claim 76, wherein step (b) additionally comprises identifying at least one tree of a first type and at least one tree of a second type, and step (c) additionally comprises creating a statistical model of tree color using the at least one tree of a first type and the at least one tree of a second type, whereby the model estimates how the color of the at least one tree of a first type and the color of the at least one tree of a second type are distributed.

Claim 80 (Original): The method of claim 79, wherein the model is a Mixture of Gaussians model.

Claim 81 (Original): The method of claim 76, wherein step (e) additionally comprising creating a tree map with tree pixels labeled.

Claim 82 (Original): The method of claim 76, wherein every pixel in said tree map is labeled with a zero if it has not been identified as a tree, or with a non-zero number if it has been identified as a tree.

Claim 83 (Original): The method of claim 76, wherein step (b) additionally comprises identifying at least one tree shadow, and step (c) comprises creating a statistical model of tree color using the at least one identified tree and the at least one identified tree shadow.

Claim 84 (Original): The method of claim 83, wherein step (d) additionally comprises using the tree statistical model and the tree shadow statistical model to create a tree probability model.

Claim 85 (Original): The method of claim 84, wherein said tree probability model is used as the statistical model to determine the probability that a pixel is a tree.

Claim 86 (Original): The method of claim 83, wherein step (c) additionally comprises obtaining a sun direction, wherein the tree shadow statistical model is updated to account for the direction of the sun.

Claim 87 (Original): A method of creating a 3-Dimensional map of an area, wherein the 3-Dimensional map identifies every pixel in the area as a tree, house or terrain and identifies the elevation of every pixel, comprising the steps of :

(a) obtaining a tree map of the area, wherein the tree map identifies pixels that have been determined to be trees;

(b) obtaining a house map of the area, wherein the house map identifies pixels that have been determined to be houses;

(c) creating a city map from the tree map and the house map, wherein every pixel has a classification, wherein the classification is selected from the group comprised of tree, house and terrain;

(d) obtaining height data;

(e) obtaining terrain elevation data; and

(f) determining an elevation for every pixel.

Claim 88 (Original): The method of claim 87, wherein said height data is comprised of an estimated house height and an estimated tree height.

Claim 89 (Original): The method of claim 88, wherein step (f) is comprised of:

(i) determining a base pixel elevation from the terrain elevation data;

(ii) determining if the pixel is a tree from the city map, and if the pixel is a tree, (iii) determining the pixel's elevation by adding estimated tree height to the base pixel

elevation;

(iii) determining if the pixel is a house from the city map, and if the pixel is a house, determining the pixel's elevation by adding estimated house height to the base pixel elevation.

(iv) if the pixel is neither a house nor a tree, determining the pixel's elevation as the base pixel elevation.

Claim 90 (Original): A computer-readable medium containing instructions that cause a computer to create a 3-Dimensional map of an area, wherein the 3-Dimensional map identifies every pixel in the area as a tree, house or terrain and identifies the elevation of every pixel, wherein said instruction include instructions to:

obtain a tree map of the area, wherein the tree map identifies pixels that have been determined to be trees;

obtain a house map of the area, wherein the house map identifies pixels that have been determined to be houses;

create a city map from the tree map and the house map, wherein every pixel has a classification, wherein the classification is selected from the group comprised of tree, house and terrain;

obtain height data;

obtain terrain elevation data; and

determine an elevation for every pixel.